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PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improvements in Apparatus for Manufacturing Pastries and Confectionery.

I, ALBERT KREMLING, a German Citizen, of Hamersleben bei Oschersleben, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to an apparatus for manufacturing pieces of pastry and confectionery on expressing machines, wherein the mass is expressed and deposited linearly.

Machines have been proposed for forming articles of confectionery having flexible nozzles provided with valves whereby the supply of the material to the nozzle could be cut off. Biscuit making machines have also been provided with immovable nozzles and laterally reciprocating die plates beneath the nozzles, while covering machines for rigid articles of confectionery have been provided with a horizontally moving belt beneath a fixed nozzle which supplied the covering material.

The main feature of the invention is characterised by continuously open nozzles connected to the expressing chamber by intermediate members, and characterised further by mechanical, periodically moved means for producing movements of the nozzles relatively to the outlet openings of the expressing chamber and relatively to the support situated below the nozzles, so that owing to the movement of the nozzles, completely closed articles of pastry, such as rings or the like, may be produced during the expressing.

The word "dressing" as hereinafter employed means a process in which masses of dough or the like are formed into lines by means of extrusion nozzles, the confectionery articles or the like being made wholly or for the greater part from the said lines. This is contrary to the decorating, garnishing or ornamenting of articles, in which the finished article is improved and ornamented by the application of a mixture:

Several constructional examples of the apparatus are shown in the accompanying drawings, wherein :

Figure 1 shows an ordinary box press with dressing nozzles.

Figure 2 is a view of the bottom plate carrying the expressing openings and having means for controlling the dressing nozzles.

Figure 3 shows tubes of another kind with nozzles and connected to openings in the bottom plate, and the device for raising and lowering the dressing nozzles.

Figure 4 is a section on an enlarged scale through a dressing tube.

Figure 5 shows a special construction of a cam disc.

Figure 1 shows an ordinary box press 1 with an expressing plunger 2, which is adapted to be actuated by a ratchet gear 3. In the bottom of the box press there are provided openings 4 to which are connected the movable intermediate members 5, for example, tubes which open into dressing nozzles 6. It is essential for the invention that the dressing nozzles remain continuously open.

The nozzles 6 in the example shown are mounted with their lower ends in a plate 7, the sides of which are provided with a projection 8 wherein are machined slots 9 and 10.

A connecting rod 12 engages in the slot 9 by means of a pin 11, the other end of which connecting rod engages by means of a pin 13 in the slot 14 of one arm of a bell crank 15. The bell crank 15 carries on its shorter arm a roller 16 engaging the lower cam track constructed in the form of a groove 17 in a cam disc 18.

One end of a connecting rod 20 is slideable by means of a pin 19 in the slot 10 of the projection 8, the other end of which rod is connected by means of a pin 21 to the slot 22 of a double armed lever 23. On its shorter end, the lever 23 carries a roller 24, which engages the upper groove 25 of the cam disc 18.

Both levers, namely the bell crank 15 and the double armed lever 23 are rotatable on a pin 26, which is secured at its lower end to a casing 28. In the casing is mounted a vertical driving shaft 29, carrying at its lower end a bevel wheel 30 which meshes with a bevel wheel 32 fast on the shaft 31. The shaft 31 is driven

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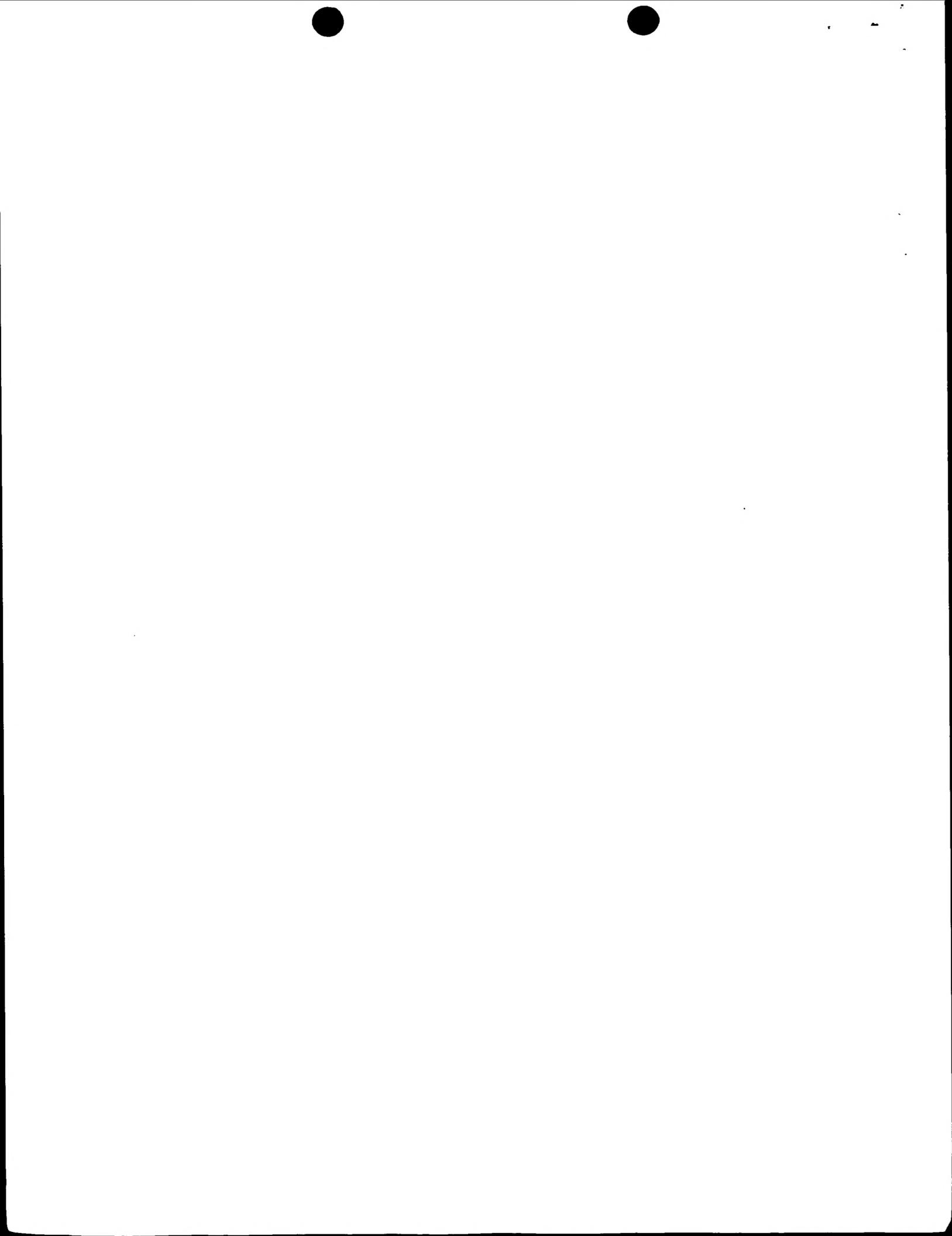
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by a chain and sprocket gear or in any other convenient way.

The shaft 29 on its upper end carries an exchangeable cam disc 18 which, as previously mentioned, actuates by means of its grooves 17 and 25 the rollers 16 and 24 as well as the bell crank lever 15 and the double armed lever 23. The levers 15 and 23 will now execute special movements according to the shape of the grooves in the cam disc 18. The lever 23, by means of the connecting rod 20, moves the plate 7 in the longitudinal direction of the machine, while the bell crank 15 by means of the connecting rod 12, moves the plate 7 at right angles to the longitudinal direction of the machine. Both movements combined produce each revolution of the cam the desired shape of the piece of pastry or other material to be manufactured.

By adjusting the connecting rod 20 in the slots 22 and 10, the amplitude of longitudinal movement of the plate 7 may be adjusted to any desired amount. By shifting the connecting rod 12 in the slots 9 and 14, the amplitude of the transverse movement of the plate is likewise adjustable as desired. Hence, it is possible to regulate the movements of the plate 7 in any way whatsoever. For example, the transverse movement may be adjusted to be small, while the longitudinal movement is adjusted to be large. Conversely, however, the transverse movement may also be made large and the longitudinal movement small. Also, both movements may be made small or large and likewise also all intermediate values may be adjusted.

The cam tracks, which serve to control the movement, instead of being on one single cam disc 18, as in the example chosen, may also be provided each on one of a plurality of cam discs. Preferably, the cam discs carrying the cam tracks are exchangeable to permit pieces of material of different shapes to be manufactured in rapid succession.

In order to permit regulation of the size of the pieces of material produced, the members controlling the driving device are adjustable. This may be accomplished in the example shown by shifting the rods 12, 20 in the slot guides 9, 10, 14 and 22.

In order to impart extra thickness to the front or rear end of the material extruded, the cam disc 18 is preferably turned forwardly or backwardly on the driving shaft 18, thus altering the expressing times in relation to the dressing times. If, however, the cam tracks 17,

25, are rotated relatively to one another, a fundamental alteration is effected in the

shape of the pieces of extruded material. Thus, it is possible to alter the shapes and contours of the work-pieces as desired.

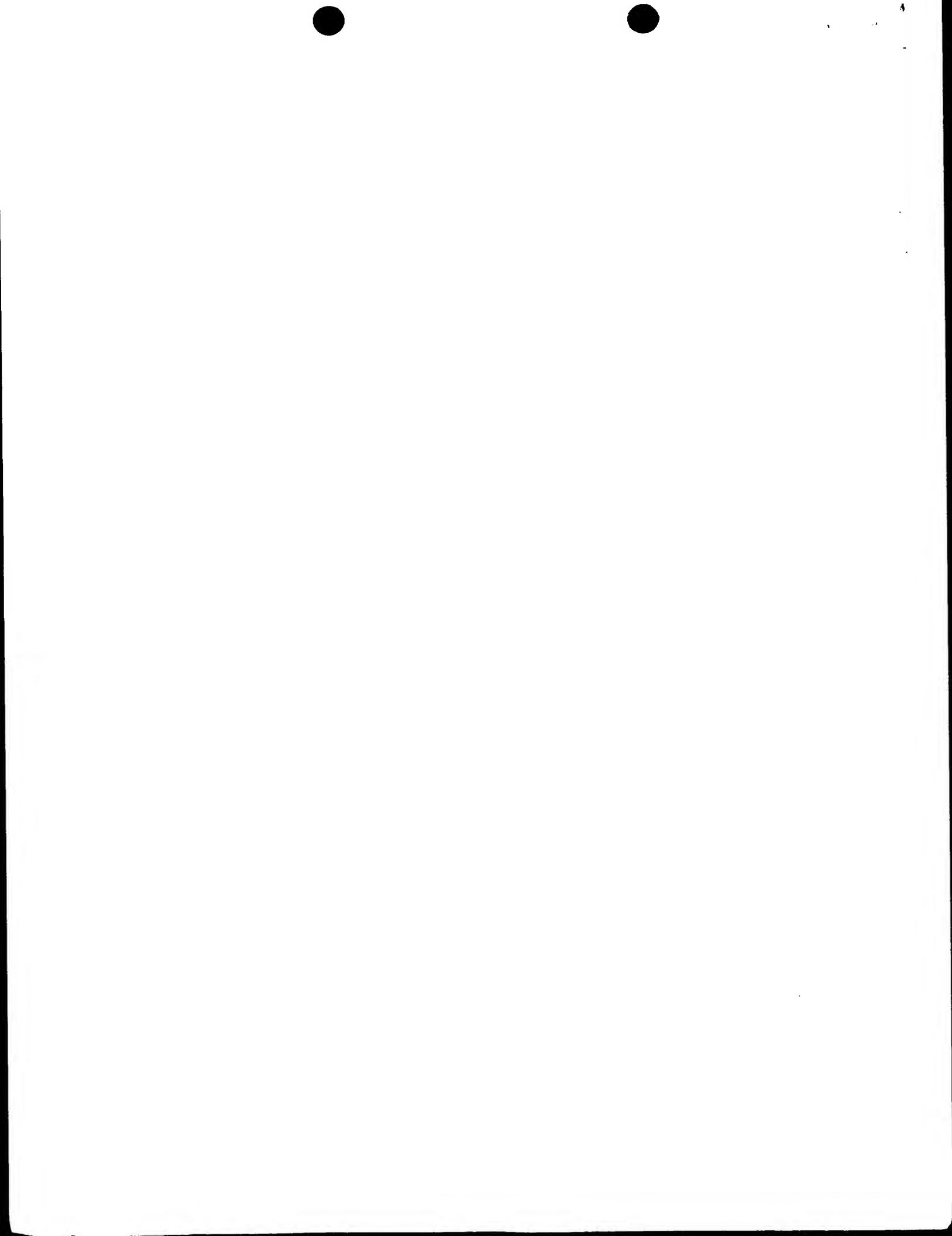
In order to detach the dressing nozzles 6 from the dressed pieces of material at 70 the end of the dressing operation, the machine is so designed that the dressing nozzles and the support (baking sheet, conveyor belt or the like) are able to execute a relative movement in a substantially vertical direction, which preferably takes place more or less abruptly. This may be attained by means of a cam gear which raises or lowers either the dressing nozzles or the extrusion device with the nozzles. In the example illustrated in Figure 3 80 there is shown such a means of control which raises the dressing nozzles themselves. In this example, the tubes are so constructed that they may be given any movement in the vertical direction. It is thus possible, according to the design of the cam tracks, to execute dressing movements in a vertical direction and to detach the nozzles from the work-pieces at 90 the end of the dressing movements.

The device comprises a cam disc 33, on which is guided a roller 34 mounted on the lower end of a rod 35. The upper end of the rod 35 engages a lever 36 which is pivoted at one end while its other end moves the dressing nozzle 6.

Figure 1 shows a cam gear which raises and lowers the support 27. For the sake of simplicity, only the cams 37 are shown, 100 the other parts of this device having been omitted. A similar construction may also be employed for raising and lowering the extrusion device with the nozzles. In the constructional example shown in Figure 105 1, the cams 37 are so designed as to cause dressing nozzles and support to approach one another or move away from one another in a substantially vertical direction and in a predetermined sequence also 110 during the dressing movement, whereby thickened portions or upwardly directed corrugations are produced on the dressed pieces of material themselves.

As regards the action of the apparatus, 115 it is immaterial whether the dressing nozzles 6 execute the one part and the support 27 executes the other part of the vertical and horizontal movements or whether the dressing nozzles execute both 120 parts of the movements. If a conveyor belt is used as a support, either the entire conveyor belt or merely that portion of the conveyor belt which is situated below the dressing nozzles, may be moved up and 125 down in order to dress the pieces of material and detach them from the nozzles.

In order that all the dressing parts of a plate shall execute the same movement, a 130



known parallel guiding arrangement is provided. Levers 38 (Figure 2) are pivotally connected at their outer ends to the box 1 by links 38a and at their centres by 5 supports 38b attached to the nozzle plate 7, the levers 38 being pivotally connected at their inner ends by a link 38c. The object of these levers is to guide the nozzle plate accurately and always in the same direction and if they were not provided a parallel guiding would be impossible, the nozzle plate becoming wedged so that the confectionery articles to be made would have different shapes. Owing to 15 the parallel guiding, however, each nozzle describes always the same path. Instead of the levers 38, however, other known means may be provided for the same purpose.

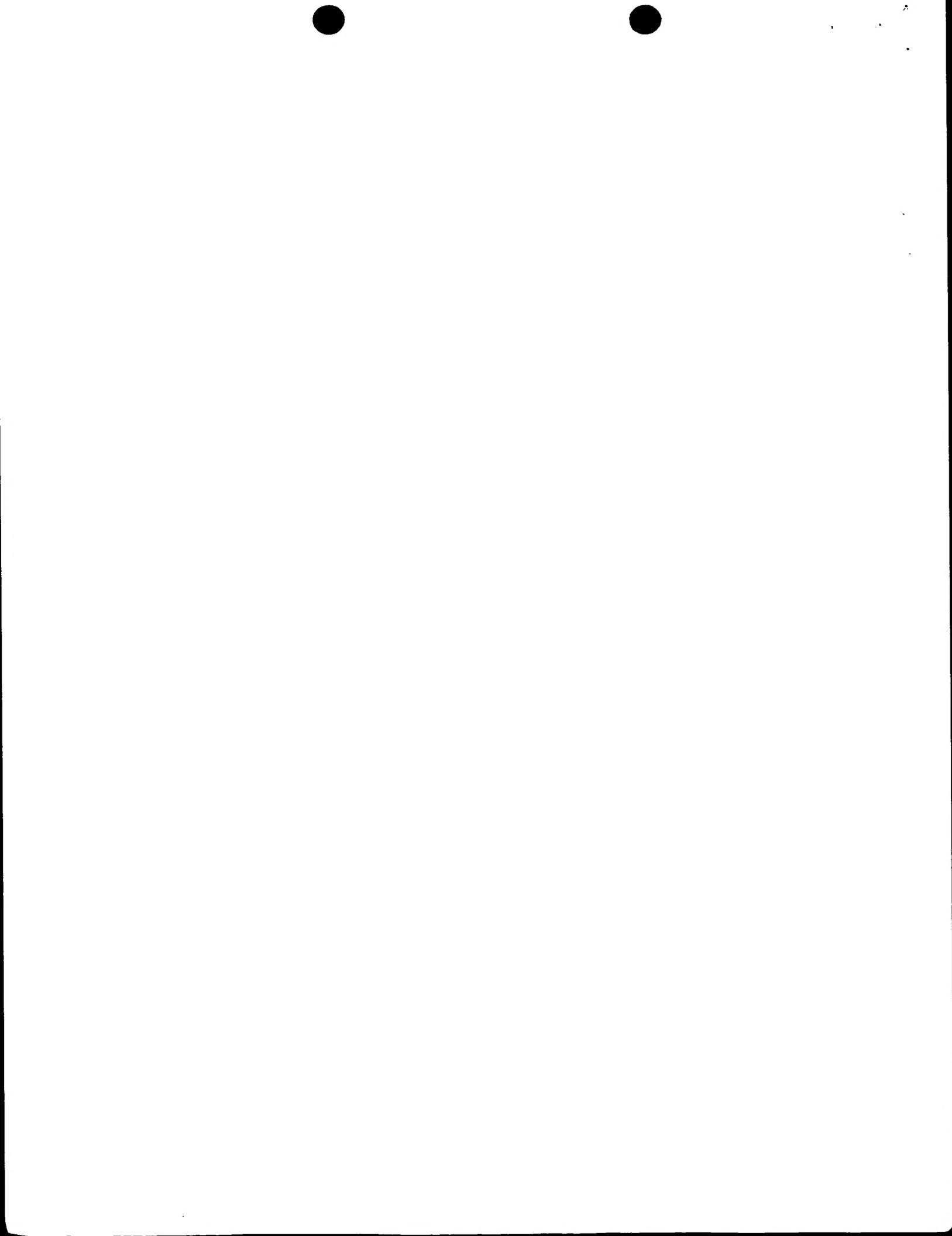
20 Figure 4 shows an intermediate member 5 on an enlarged scale. The intermediate members 5 (in the example, tubes) are attached in the openings 4 in the bottom plate and terminate downwardly 25 in mouthpieces fixed to the plate 7. The nozzles 6 are then screwed for ready interchangeability to the said mouthpieces.

Figure 5 shows a particular design of the cam disc 54 for driving the ratchet gear 3 in Figure 1. Due to the design of 30 the cam disc, the expressing of the material does not take place in one continuous operation but intermittently, thus producing streaks of extruded material 35 of straight or curved form and of varying thickness.

The apparatus according to the invention is not restricted to the constructional examples. For example, the dressing 40 movement in the horizontal plane may be composed of two resultant movements in such a way for example that the dressing nozzles move only transversely of the machine, the support executing the movement 45 in the longitudinal direction of the machine that is required for the shape, or vice versa.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An apparatus for manufacturing pieces of pastry or confectionery on expressing machines, wherein the mass is expressed and deposited in lines, characterised by continuously open nozzles (such as 6), which are connected to the expressing chamber by intermediate members (such as 5) and further characterised by 55 mechanical periodically moved means for producing movements of the nozzles (such as 6) relatively to the outlet openings of the expressing chamber (such as 4) and 60 relatively to the support (such as 27) situated below the nozzles, so that owing to the movement of the nozzles, completely closed articles of pastry, such as rings or the like, may be produced during the expressing.
2. An apparatus as claimed in claim 1, characterised in that members which are movable in themselves, for example tubes, flexible pipes or the like, serve as intermediate members between the nozzles and the expressing chamber.
3. An apparatus as claimed in claim 1, characterised in that the nozzles (such as 6) and the support (such as 27) (plate, baking sheet, conveyor belt or the like) execute relative movement with respect to one another in the horizontal direction, so that owing to the movement of the nozzles, completely closed articles of pastry, such as rings or the like, may be produced during the expressing.
4. An apparatus as claimed in claim 1, characterised in that the nozzles (such as 6) and the support (such as 27) (plate, baking sheet, belt or the like) execute in a vertical direction a relative movement with respect to one another at the beginning and end of, and also if necessary during, the dressing process.
5. An apparatus as claimed in claim 1, characterised in that the nozzles (such as 6) and the support (such as 27) (plate, baking sheet, belt or the like) execute relative movements in the horizontal direction with respect to one another, and in addition, at the beginning and end of, as well as if necessary also during, the dressing process execute relative movements with respect to one another in the vertical direction.
6. An apparatus as claimed in Claims 1 to 6, characterised in that means are provided to interrupt expressing at predetermined intervals of time.
7. An apparatus as claimed in Claims 1 to 6, characterised in that the members controlling during the dressing process the open dressing nozzles (such as 6) or the support (such as 27) (baking sheet, conveying belt or the like) are adjustable (Figure 2).
8. An apparatus as claimed in Claims 1 to 7, characterised in that at least two cams (such as 17, 25) serve for driving the controlling members (such as 15, 23), the individual movements of which cams provide the resultant movement of the dressing nozzles or of the support.
9. An apparatus as claimed in Claims 1 to 8, characterised in that the cams (such as 17, 25) are arranged on exchangeable discs (such as 18).
10. An apparatus as claimed in Claims 1 to 9, characterised in that the cams are arranged on a single disc (such as 18). 130



11. An apparatus as claimed in Claims 1 to 10 characterised in that the disc (such as 18) carrying the cams is adjustable on the driving shaft (such as 29) in order to vary the expressing period in relation to the dressing period.

12. An apparatus as claimed in Claims 1 to 11, characterised in that the individual cam tracks (such as 17, 25) are adjustable relatively to one another.

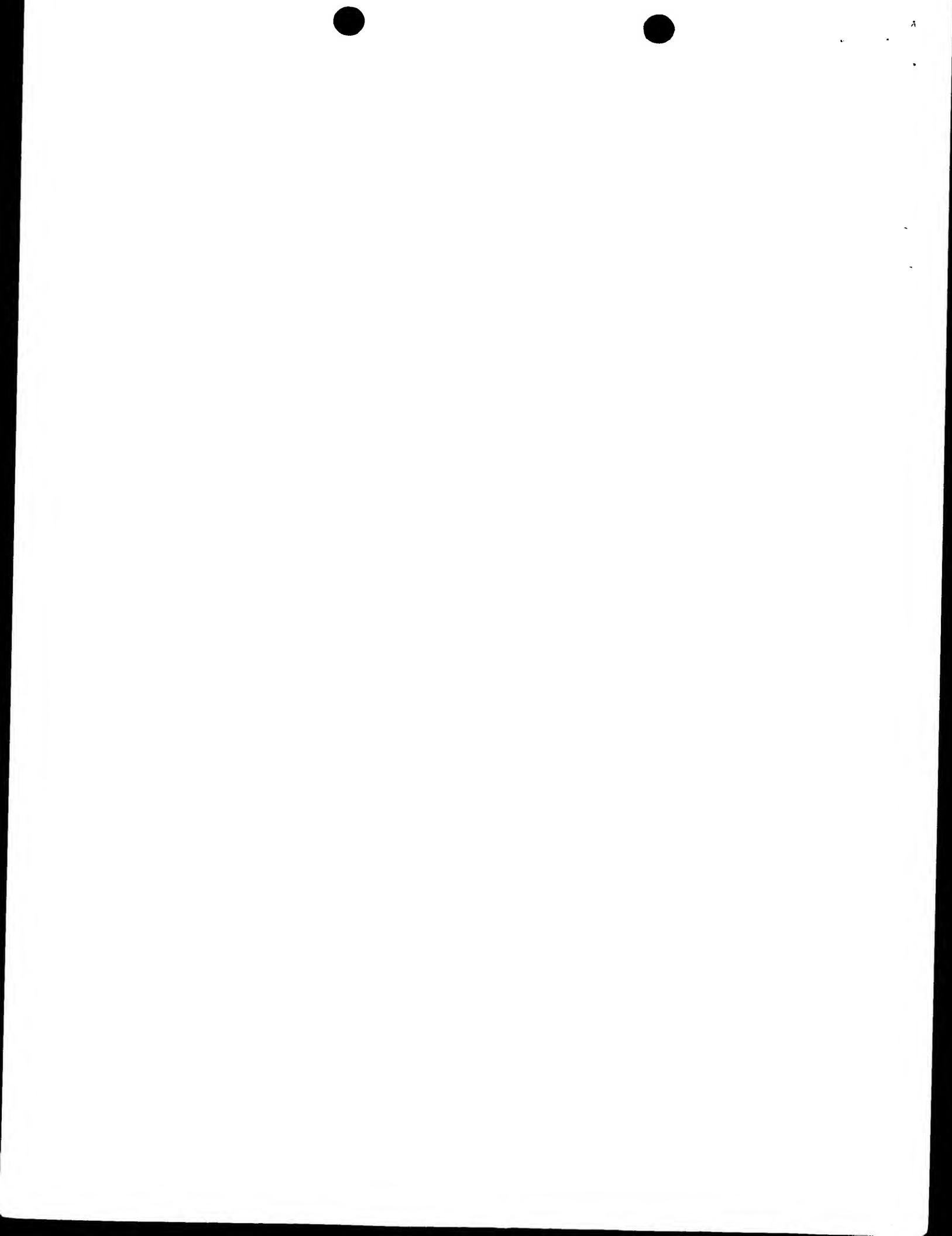
13. An apparatus as claimed in Claims 1 to 12, characterised in that the movements of the cam disc of the driving device for the dressing nozzles or for the support are transmitted by means of adjustable levers (such as 15, 23) so that the amplitude of the dressing movements may be adapted to the size and shape of the desired pieces of extruded material.

14. An apparatus as claimed in Claim 13, characterised in that two independently adjustable levers (such as 15, 23) are provided, each of which is influenced by a cam surface (such as 17, 25) of the driving device and brings about the transverse and longitudinal movement of the dressing nozzles or of the support (baking sheet, conveyor belt or the like).

15. Apparatus for manufacturing pastries and confections substantially as described or substantially as shown in the accompanying drawings.

Dated this 16th day of March, 1931.
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[This Drawing is a reproduction of the Original on a reduced scale]

Fig. 1.

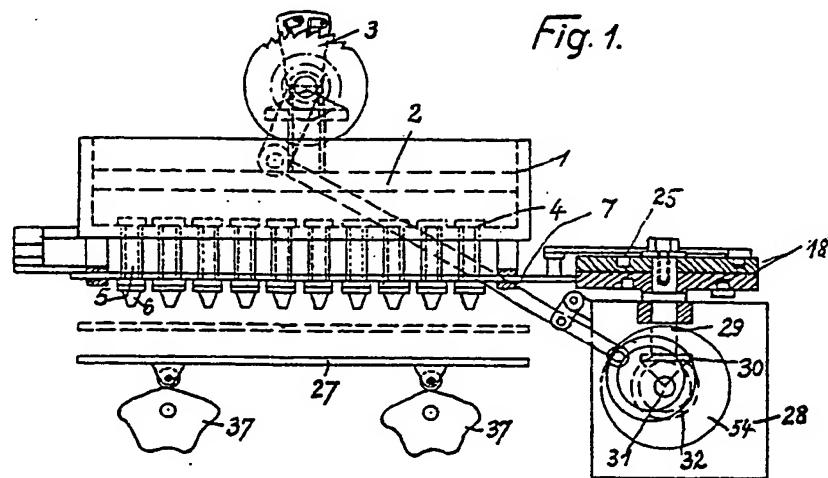
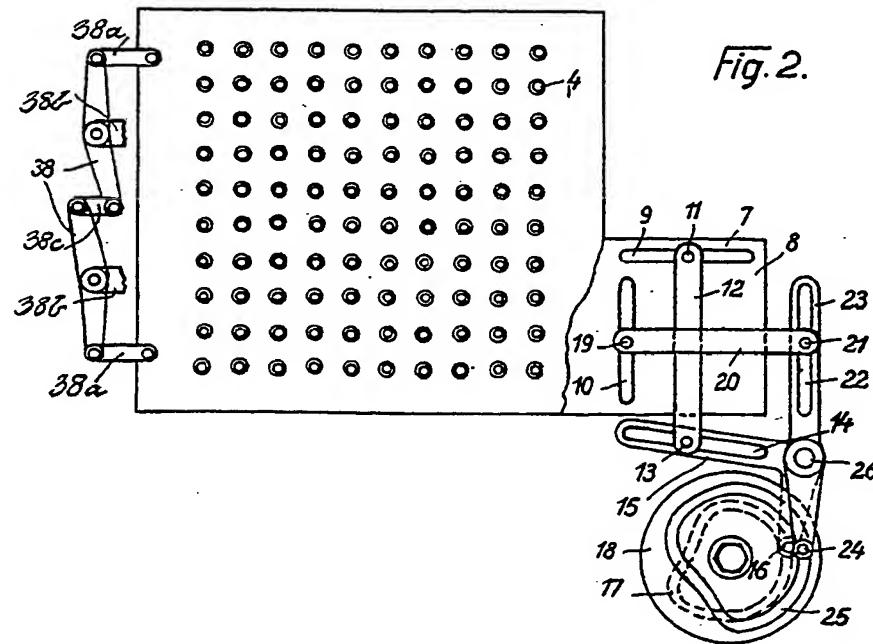


Fig. 2.



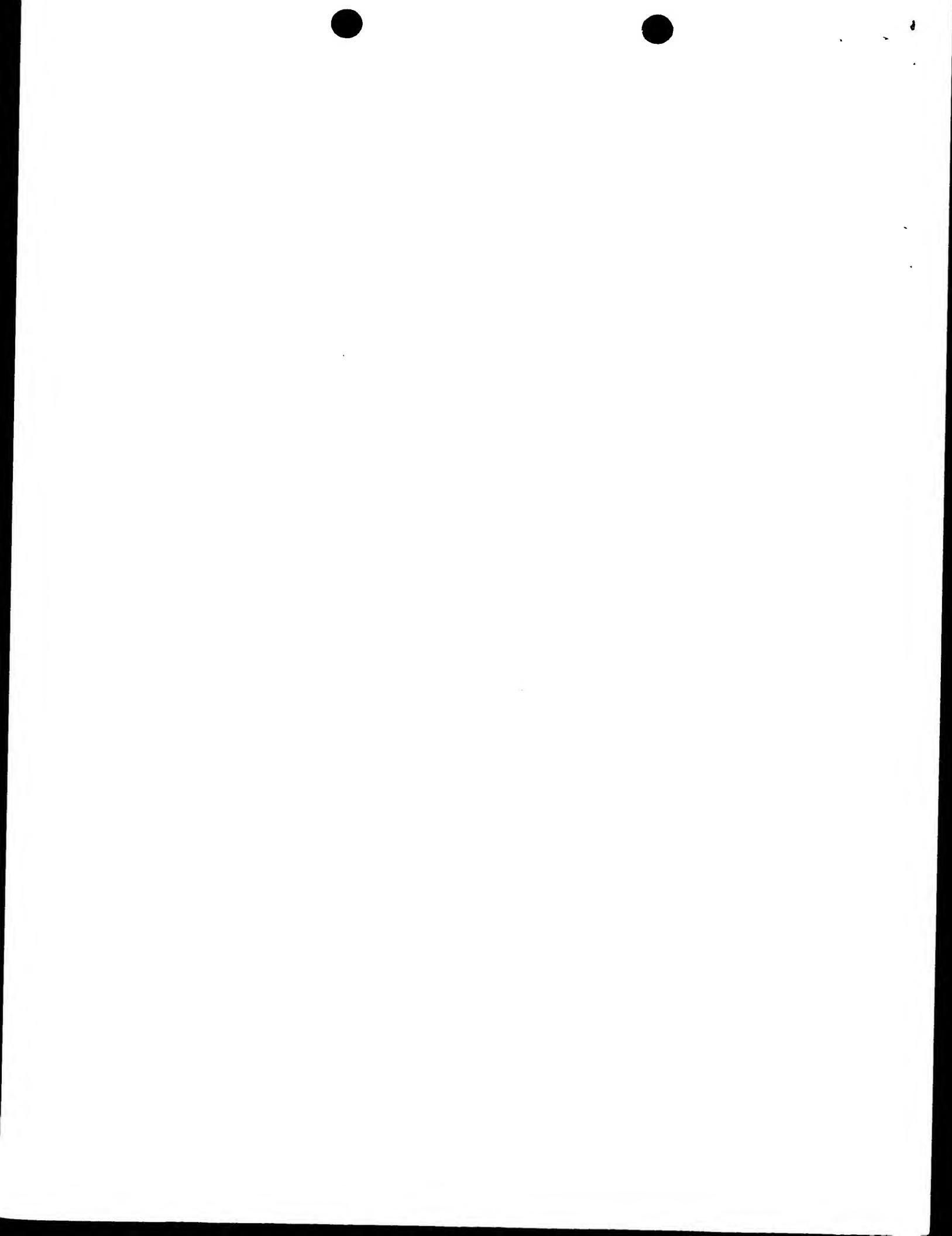
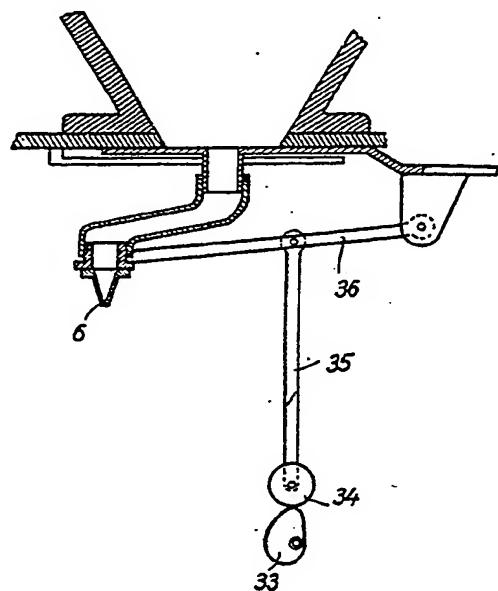


Fig. 3.



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Fig. 5.

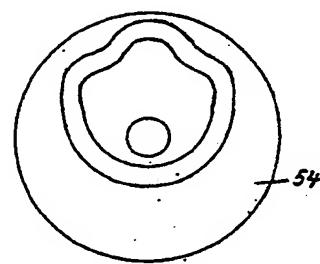
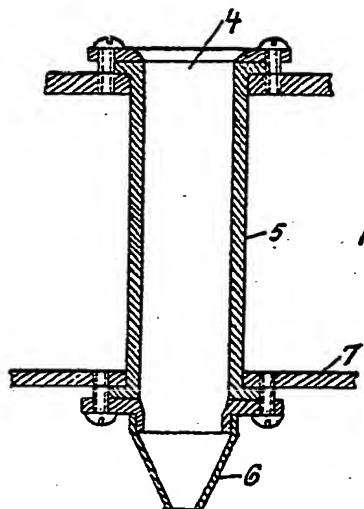
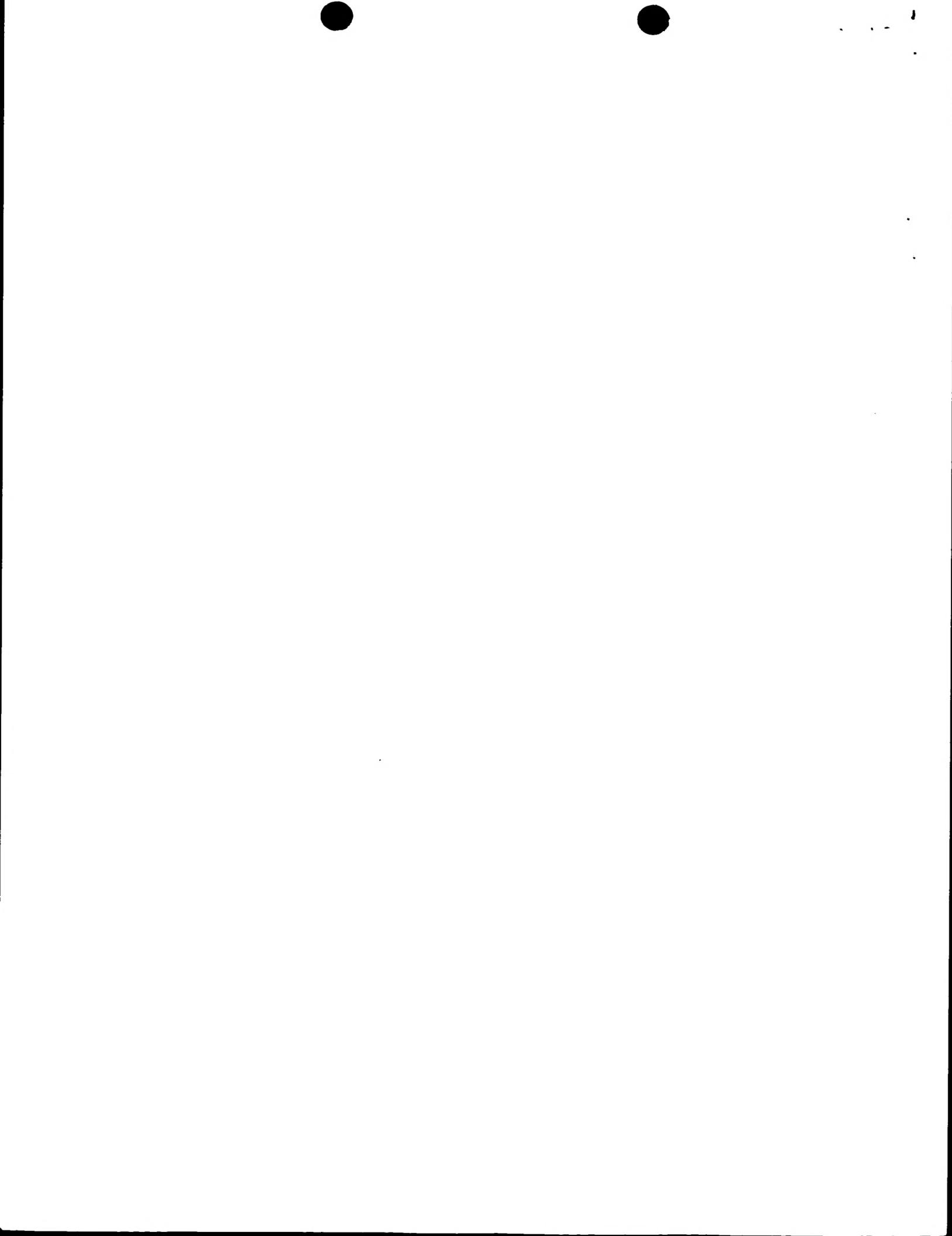


Fig. 4





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SHEET 1

